



Third West Weekly Report Shepherd, Michael

Joyce Ackerman, 'Craig Barnitz (cbamitz@utah.gov)'

04/18/2012 11:50 AM

Hide Details

From: "Shepherd, Michael" < Michael. Shepherd@rockymountainpower.net>

To: Joyce Ackerman/R8/USEPA/US@EPA, "'Craig Bamitz (cbamitz@utah.gov)'" <cbamitz@utah.gov>

#### 9 Attachments











Weekly Report 04-09 to 04-15-12.pdf Third West Weekly Log 2012-15:pdf 233392-1.pdf 233475-1.pdf 233578-1.pdf









233697-1.pdf 233804-1.pdf 233893-1.pdf 233894-1.pdf

Joyce & Craig,

Attached are the reports for the week of April 9, 2012.

All air monitoring results came back negative.

Please let me know if you have any questions.

Thanks, '

Mike Shepherd
Project Manager
Rocky Mountain Power - Major Projects
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801.631.1310 Cell
801.220.2797 Fax
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# **HEALTH SAFETY MANAGER (HSM)**

		DAILY CHECKLIST
OATE	:	04/09/11
•		
	<u>neral</u> Work	ones Health and Cafaty Inspection
		area Health and Safety Inspection
NA	<b>L</b>	Review and if necessary update Activity Hazard Analyses (AHA) based on planned site
NA		activities for the day Safety Planning or "Tailgate" mandatory meeting for all employees and contractors prior
INA	<b>L</b>	to commencement of any site work. Instruction, review hazards, health & safety issues and any modifications to the CSHASP
NA		Site hazard and safety instruction for all first time employees, contractors or visitors
NA		Complete Employee Meeting Record Form B (where applicable)
NA		Document required Respirator Training completion with Form H
NA	_	Record times and numbers of dump trucks and trailers as they leave the site with
1A		contaminated material.
NA		Confirm return of waste material manifest documents for each load with site
12 %		manager.
NA	Compl	ete all CSHASP Forms (for applicable activities planned for that day)
	NA	Illness/Injury Report Form A
	NA	Site-Specific Training Record Form C
	NA	Hot Work Permit Form D
	NA	Trench/Evacuation Permit Form E
	NA	Combined Space Entry Permit From F
		Exclusion zone operations are practiced as instructed.
		Decontamination unit is working properly.
		✓ Workers are using decontamination unit as instructed.
		☑ Workers use personal protective equipment properly.
		Set air samples at cardinal compass points around exclusion zone. Check
		throughout the day to ensure proper operation.
		Observe control measures for dust and fugitive materials i.e. watering excavation
	(	sites and track out prevention.
$\checkmark$		Review sign-in/sign-out log throughout and at the end of the workday.
		Secure the site at the end of the workday
2	1.	
Sa	mpling	
NA	Soil C	onfirmation sampling for any newly excavated areas
<b>7</b>	,	Stationary Air Monitoring during contaminated soil removal around the perimeter of the exclusion zone
NA	<b>\</b>	Personal Breathing Zone Monitoring on personnel conducting contaminated dust and soil
		removal
NA	A	Digitally photograph each sample location and at any place field sampling personnel determined necessary





Electronically file photo files into the on-site database
Complete Field Documentation
Field Sample Data Sheets (FSDS)
Logbook
On-site computer database
Label each sample media with a unique number
Seal sample(s) in zip lock plastic bags
Complete and include Chain of Custody (COC) Form required for shipping of samples to appropriate laboratory
Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental
Samples
Review and disseminate sample results as received from the laboratories to Project
Manager and other appropriate managers and employees
Electronically file sample reports into on-site database





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# 3<sup>RD</sup> WEST SUBSTATION REMEDIATION PROJECT **HEALTH SAFETY MANAGER (HSM)**

		<u>DAILY CHECKLIST</u>
DATE	:	04/12/11
<b>~</b>	1	
	neral Work	ouse Health and Cafety Inspection
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		•
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DATE:	04/13/11
<u>General</u>	
	k area Health and Safety Inspection
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Project: 3rd West Sub Station	Date: 04/09/12
Location: 3rd West, 1st South, SLC	Job Number:
Survey Conducted By: Justin Kargis	Title:

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			х	1
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			х	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	х	7		
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			x	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			х	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

Standard	Title	In Compliance	Out of Compliance	D N/A	Corrective Action Taken and Date
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			х	
1926.20 (b)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			х	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			х	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			х	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			х	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			х	
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a) (4)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			х	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			х	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			х	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			х	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	х			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	х			
1926.102 (a) (1)	Eye and face protection shall be provided.	x			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			х	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			Х	

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			x	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	x			
1926.451 (a)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			х	
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			х	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			х	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	

Exclusion zone active once excavations began.

Newman washed out 12 trucks and trailers throughout the day. They removed 1 section of cable tray next to the control building. They excavated imported material in this area and covered it for removal. They finished compaction of material near the north gate and. They also dug near the west wall to locate conduit lines.

CVE fabricators poured a small amount of concrete under the gate apron at the north gate.

CVE line crew continued working on structure and componentry and left after lunch for training.

Weather was warm, dry, and sunny. Temperatures in the mid 60's and light breezes.



Project: 3rd West Sub Station	Date: <u>04/10/12</u>
Location: 3rd West, 1st South, SLC	Job Number:
Survey Conducted By: Justin Kargis	Title:

Standard	Title	[] In Compliance	Out of Compliance	D N/A	Corrective Action Taken and
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			х	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	х			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			х	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			х	
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1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			х	
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1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			х	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			х	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			х	,
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			х	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			х	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	х			\$ m
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	x			<i>y</i>
1926.102 (a) (1)	Eye and face protection shall be provided.	х			, . ,
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	X			
1926.350 (a)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			х	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			Х	

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	х			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.		2	х	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	x			
1926.451 (a)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x		(F)	
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.		8	x	
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			х	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	

Exclusion zone active once excavations began.

Newman washed out 12 trucks and trailers throughout the day. They dug trenching for the cable tray along the fence next to Artistic Printing. As they were digging, occasionally some native soil was exposed and then covered by back fill or sand.

CVE fabricators worked with Newman on the cable tray trenching.

CVE line crew continued working on structural steel and componentry.

Weather was warm, sunny and dry with light breezes and temperatures in the mid 70's.



Project: 3rd West Sub Station	Date: <u>04/12/12</u>
Location:3rd West, 1st South, SLC	Job Number:
Survey Conducted By: Justin Kargis	Title:

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			х	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.		0.5	x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	х			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.		a .	х	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			х	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			х	,
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			х	
1926.20 (b) (1)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			х	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			х	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			х	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			х	
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date Terror Tuken und
1926.451 (a)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			х	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	х			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			х	
1926.651 (j)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	x			•
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	х			d
1926.102 (a) (1)	Eye and face protection shall be provided.	х			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	х			
1926.350 (a) (9)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			х	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			Х	

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	х			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			х	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	х			
1926.451 (a) (2)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	х			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			х	
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			х	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

J. W. Stein and L. Stein, P. S. Steiner.

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.		·	х	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	, ,

Exclusion zone not active today.

Newman excavated for and placed vaults in the S.E. corner of the yard. This dig temporarily exposed an area of native soil. This soil was covered by gravel and backfill material soon after the excavation was completed. They also dug trenches for conduit lines between the risers.

Newman placed the conduits in these trenches and CVE fabricators poured FTB to cover them.

Weather was cool, wet and rainy after around 11 a.m. Rain persisted throughout the afternoon which created muddy conditions.

Storm water drainage appeared to be contained within the yard with no visible flows to the outside of boundary fences.



Project: 3rd West Sub Station	Date: 04/13/12
Location: 3 <sup>rd</sup> West, 1 <sup>st</sup> South, SLC	Job Number:
Survey Conducted By: _Justin Kargis	Title:

Standard	Title	In Compliance	Out of Compliance	O N/A	Corrective Action Taken and Date
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			х	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	x			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			х	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			x	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.652 (a) (1)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			х	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			x	
1926.20 (b)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			х	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			х	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			х	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			х	
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			х	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			x	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			х	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	X			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	х			
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	х			
1926.102 (a) (1)	Eye and face protection shall be provided.	х			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	х			
1926.350 (a)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			х	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			Х	

Standard	Title	In Compliance	Out of Compliance	N/A	Corrective Action Taken and Date
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			х	
* 1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	х			
1926.451 (a)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	х			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.		,	x	*
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x	5)		
1926.556 (b)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			-
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			x	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			x	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			х	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	

Exclusion zone not active today.

Newman excavated for and placed conduit lines along the south side of the yard. They also excavated an trench from the vault near the corner of the Artistic Printing building running to the east. This temporarily exposed an area of native material that was soon covered with plastic by CVE fabricators prior to pouring FTB to cover the conduit line.

CVE fabricators poured FTB over conduit placed in trench along south side.

CVE fabricators continued to work on structure steel and attaching cables to circuit breakers.

CVE electricians worked on wiring around the transformer in bay 1.

Weather was cool and mostly cloudy with temperatures in the low 50's. Clouds cleared in the afternoon.



Project: 3rd West Sub Station	Date: 04/14/12			
Location: 3rd West, 1st South, SLC	Job Number:			
Survey Conducted By: _Justin Kargis	Title:			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			x	× -
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			x	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	х			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			х	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			х	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	x		s	de .

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.652 (a)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			х	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			х	
1926.20 (b)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			х	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			x	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			х	
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.			х	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			x	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х		, ,	

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			х	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			x	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	х			
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			x	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	х			*
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	х			
1926.102 (a) (1)	Eye and face protection shall be provided.	х			
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			
1926.350 (a)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			x	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			Х	

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		In Compliance	Out of Compliance	, N/A	Corrective Action Taken and
Standard	Title				Date
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	х			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			х	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	х			
1926.451 (a)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	х			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			х	
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	х			
1926.556 (b) (2)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	х			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			х	
1926.451 (a)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			х	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	х			

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		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			x	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	

### Comments:

Exclusion zone active once excavations began.

Newman continued trenching for 138 kV line along south fence. They eventually uncovered native soil and the exclusion zone was extended to include this section. From this point forward, they suited up to continue digging the trench that turned to the north in the S.W. corner of the yard.

CVE fabricators poured 20 yards of 20 psi concrete in the newly dug trench. This involved temporary work around the exposed native material where the exclusion zone was opened up for the concrete trucks to pour. They continued working on excavating for and setting cable tray for control wires around and under the structure steel.

CVE line crew began trenching for ground grid in the north arm. This activity involved digging into native material in various locations and was suspended and exposed soil that was deposited was covered with plastic. The line crew has not completed the 40-hour training and alternative means were discussed for completing this trenching by CVE or Newman workers who are HAZWOPER trained.

CVE electricians worked on setting conduit between switch gear and breakers/CCVT/transformers. Weather was cool and mostly cloudy with temperatures in the low 50's and light sprinkles in the late afternoon. Yard soil remains quite wet after heavy rains over the last 2 days.



# 3<sup>rd</sup> West Substation Site Project Safety Audit

Project: 3rd West Sub Station	Date: 04/15/12
Location: 3rd West, 1st South, SLC	Job Number:
Survey Conducted By: Justin Kargis	Title:

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.59	Hazard Communication Program, List of Chemicals, Training, MSDSs.			х	
1926.500 (b) & (d) (old standard)	Guardrails on open sided floors, floor holes and runways.			х	
1926.404 (b)	Ground fault circuit interrupters or an assured equipment grounding conductor program in use.	х			
1926.451 (b)	The employer shall instruct each employee in the recognition and avoidance of unsafe conditions.			х	
1926.451 (d)	Tubular welded scaffolds shall be properly braced so that they are plumb, square and rigid; legs on plumb, adjustable, mud sills, etc. to support the maximum load; guardrails and toe boards shall be installed.			х	
1926.100 (a)	Head protection, where there is a possible danger of head injury.	х		٠	

Standard	Title	In Compliance	Out of Compliance	O N/A	Corrective Action Taken and Date
1926.652 (a)	Excavation protective systems; examination by competent person when less than 5 feet in depth.			х	
1926.20 (b) (2)	Employer responsibility to initiate and maintain safety and health programs.			х	
1926.20 (b)	Employer responsibility to provide for frequent and regular inspections by designated competent persons.			x	
1926.451 (e)	Manually propelled scaffolds shall have tight planking for the full width, platforms secured, ladder or stairway provided, suitable footing, stand plumbs, wheels locked, guardrails and toe boards.			x	
1926.1052 (c) (1)	Stair rail and handrail along each unprotected edge.			X°	
1926.25 (a)	Debris, scrap lumber with protruding nails, not cleared for work areas, stairs and around structures.			x	
1926.50	First aid shall be available in the absence of an infirmary, or other that is reasonably accessible; first aid supplies shall be accessible and telephone numbers posted.			x	
1926.451 (a) (13)	Scaffolding safe access not provided by ladder or equivalent.		,	x	
1926.651 (k) (1)	Excavations, protective systems, inspected daily by a competent person and as needed.			х	
1926.403 (b) (2)	Employer shall ensure electrical equipment is free from recognized hazards, is suitable, used in accordance with the listing, labeling or certification.	х			,

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a)	Scaffolding shall have guardrails and toe boards when more than 10 feet high and when less than 45 inches of work space.			х	
1926.405 (g) (2)	Flexible cords shall be used without splice or tap; strain relief shall be provided.			х	
1926.405 (b)	Electrical boxes, fittings shall have covers, faceplates or canopy and holes shall be smooth where cords pass through; and unused openings in cabinets/boxes shall be closed.	x	sc.		
1926.701 (b)	Reinforcing steel onto which employees could fall shall be guarded.			х	
1926.1053 (b) (1)	Portable ladder side rails extend at least 3 feet or be secured at top.			x	
1926.651 (j) (2)	Excavations shall have materials or equipment placed at least 2 feet from the edge.			x	,
1926.651 (c) (2)	Excavations shall have a safe means of egress such as ladders, ramps, etc.	х			· ·
1926.150 (c) (1)	Portable fire fighting equipment shall be provided and extinguishers shall be inspected periodically.	х			
1926.102 (a) (1)	Eye and face protection shall be provided.	x	à		
1926.300 (b) (2)	Guards for power tools shall be used and moving parts of equipment shall be guarded.	x			,
1926.350 (a)	Oxygen cylinders in storage shall be separated from fuel gas cylinders by at least 20 feet or a ½ fire resistance barrier.			х	
1926.405 (a) (2) (ii) (e) & (f)	Temporary lights shall be protected from breakage, not suspended by their cords and extension cord.			X	

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.405 (a) (2) (ii) (j)	Extension cords used with portable electric tools shall be of three wire type and designed for hard or extra hard usage.	x			
1926.105 (a)	Workplaces more than 25 feet above the ground or water shall have safety nets when ladder, safety line/belts, temporary floors, scaffolds, catch platform are not practical.			х	
1926.1051 (a)	Stairway or ladder shall be provided at all access points where there is a break in elevation of 19 inches or more.	x			
1926.451 (a)	Scaffolding footing or anchorage shall be sound, rigid and capable of carrying the maximum intended load.	x			
1926.500 (c) (1) (old standard)	Wall opening shall be guarded.			x	
1926.404 (f)	Electrical equipment connected by cord and plug shall be grounded except if there is an isolating transformer or the tool is double insulated.	x			,
1926.556 (b)	When working from an aerial lift, a full body harness and lanyard attached to the boom or basket.	x			
1926.501 (b) (1) (new standard)	Guardrails, safety nets or personal fall arrest system shall be used at 6 feet or more.			х	
1926.451 (a) (14)	Scaffold planking shall extend over their end support not less than 6 inches and not more than 12 inches.			х	
1926.602 (a) (9)	Bi-directional earth moving equipment shall have audible alarms.	x			

		In Compliance	Out of Compliance	N/A	Corrective Action Taken and
Standard	Title				Date
1926.451 (a) (3)	Scaffolding shall be erected, moved, dismantled or altered under the supervision of a competent person.			х	
1926.550 (b) (2)	Cranes, crawler, truck or locomotive, shall meet the design, testing, maintenance, and operation per ANSI B30.5_1968. The most recent certification shall be on file until a new one is prepared.			х	

# Comments:

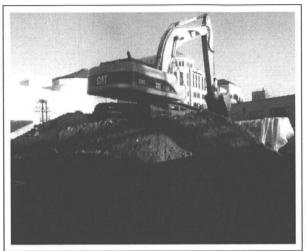
Exclusion zone not active today.

CVE fabricators continued excavating for and setting cable tray for control cables around and under the structure steel.

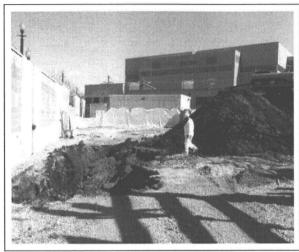
CVE line crew set grounding rods throughout the yard and began work on ground mats.

CVE electricians worked on conduit connecting switchgear and other equipment.

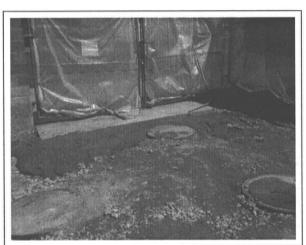
Weather was partly cloudy, dry, and mild. Temperatures near 60 and no winds.



РНОТО 1



РНОТО 2



РНОТО 3



РНОТО 4

# R & REnvironmental, Inc.

47 West 9000 South, Suite #2, Sandy, Utah 84070 (801) 352-2380 • Fax: (801) 352-2381

PROJECT NO:

DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/09/12	FILE:	

# SITE PHOTOGRAPHS





РНОТО 1

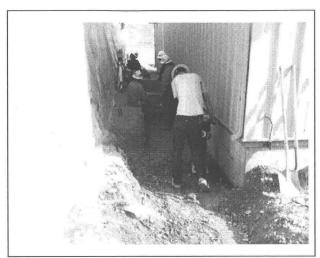
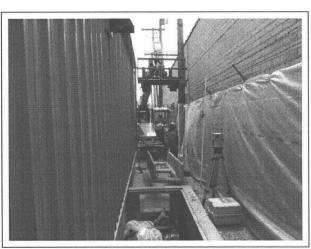


PHOTO 2



РНОТО 3



РНОТО 4

PROJECT NO:

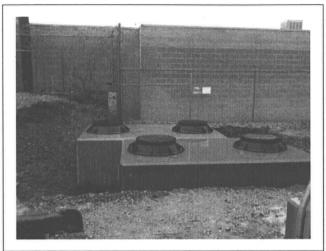
DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/10/12	FILE:	

# SITE PHOTOGRAPHS

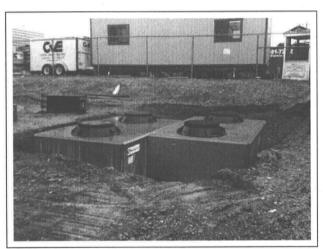




РНОТО 1



РНОТО 2



РНОТО 3



РНОТО 4

PROJECT NO:

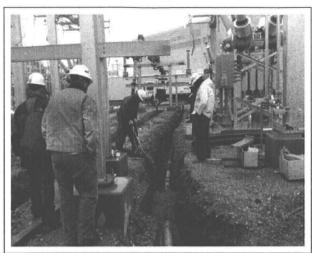
DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/12/12	FILE:	

# SITE PHOTOGRAPHS









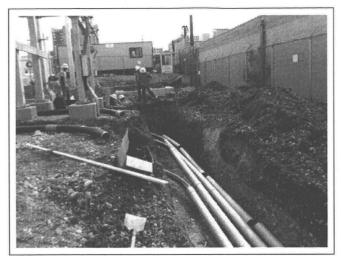
РНОТО 6

PROJECT NO:

DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/12/12	FILE:	

SITE PHOTOGRAPHS





РНОТО 1



РНОТО 2



РНОТО 3



РНОТО 4

PROJECT NO:

DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/13/12	FILE:	

SITE PHOTOGRAPHS





РНОТО 1



РНОТО 2



РНОТО 3



РНОТО 4

PROJECT NO:

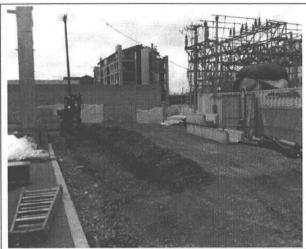
DESIGNED BY:	SCALE:	REVIEWED BY: DCR		
DRAWN BY: JMK	DATE 04/14/12	FILE:		

SITE PHOTOGRAPHS





РНОТО 1



РНОТО 2



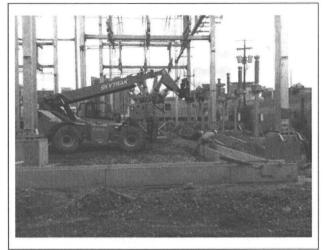
РНОТО 3

PROJECT NO:

DESIGNED BY:	SCALE:	REVIEWED BY: DCR			
DRAWN BY:	DATE	FILE:			
JMK	04/14/12	4			

SITE PHOTOGRAPHS





РНОТО 1



РНОТО 2



РНОТО 3

PROJECT NO:

DESIGNED BY:	SCALE:	REVIEWED BY: DCR	
DRAWN BY: JMK	DATE 04/15/12	FILE:	

SITE PHOTOGRAPHS



# PACIFICORP OPERATIONS - Field Construction Representative Daily Log PROJECT NAME: Third West Sub - Rebuild DATE: Monday, April 9, 2012 3000078050 / 10035803 MAIN CONTRACTOR: Cache Valley Electric PO & Work Order NO.: Crew Start Time: Crew Stop Time: 16:15 Tot Hrs mns: 17:50 FCR Start Time: 6:49 FCR Stop Time: Tot Hrs mns: Use military time format 00:00 **WEATHER CONDITIONS:** Sunny - 45 degrees in PM, 70 degrees in PM DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.) R&R set up four monitors. CVE Fab Crew placed flowable fill under the gate apron on the north side of the project, near the control building and is cleaning up materials no longer required for the job and demobing from the site to Ft. Douglas. CVE Line Crew is working on piping of 138 kV ABS and installed ground blades on switches 150 A and 151 A. Newman is processing six Geary tracks with material to Clean Harbors (6 in the AM and 6 in the PM) and excavated and located the conduits near the west wall for the 138 kV feeds from Jordan and Gadsby. They located the two sets of four conduits inside the west wall about eight feet in and about nine feet deep. Newman also removed the cable trench from the backside of the control building and staged the contaminated materials under visqueen. Capital Electric is in the control building completing their work on the 48 V battery system. RMP Relay personnel are on site again today. CVE Line Crew = 4, CVE Fab Crew = 4, Newman = 5, Geary = 6, Capital Electric = 2, R&R = 1, Wilding = 1. IF WORKING IN ENERGIZED SUBSTATION: Dispatcher login, name and time: Gus Montanez 0649 Dispatcher logout, name and time: Jim Bowman 1750 DISCREPANCIES: IMMEDIATE CORRECTIVE ACTION TAKEN: 3/23 - Still waiting for the second CT terminal block from Hyundai Confirmed with Ken Foster on 3/22 that RMP has not received 4/9 - Identifed an issue with mounting of the ground blades on 150A and 151A Sent email and pictures to Roger F and Mike S 11/30 - Identified an additional retaining wall that is below grade and does not show on the Will excavate to determine dimensions. 12/15 - Excavated to locate the 46 kV cables exiting the west side of the yard. Dug 8' and Sent e-mail to Roger F. didn't find them. Will try again. Actual deoth will be much deeper than design of new DELAYS OR LOST TIME ENCOUNTERED: EQUIPMENT (working, delivered, idle): CVE fab crew: Portable toilet (3), forklift, 1 dumpster, office trailer, conex, exclusion zone conex, (2), tool trailer, crew truck. CVE Line Crew: Pickup (2),

JLG (2), tool trailer Newman: trachoe (3), loader, bobcat, mini-ex, water truck, compactor, backhoe

OSHA Recordable Safety Incidents:	Reported by:	Time:

# **Rocky Mountain Power**

Russ Johnson

Field Construction Representative

PROJECT NAME:	Third West Sub - Rebuild			DATE	: Tue:	Tuesday, April 10, 2012		
PO & Work Order NO. :_		30000780	050 / 10035803	MAIN CON	TRACTOR	: Cache Valle	y Electric	
Crew Start Time:	6:	50	Crew Stop Time	17:	10	Tot Hrs mns:	10:20	
FCR Start Time:	6:	37	FCR Stop Time	17:3	30	Tot Hrs mns:	1 <b>0</b> :53	
Use military time format 00			•					
· ,								
WEATHER CONDITIONS	S: ·	· · · · · · · · · · · · · · · · · · ·	<b>Sunny</b> - 51 <b>d</b> eg	rees in PM, 81	degrees in	PM		
			omments, instructions to					
and set anchors for the two vinsulators over the 46 kV PT PM) and removed the cable. They moved the contaminate placing of cable trench from	west circuit position. I trench fron material the control tem. RMP	breakers, re Newman is p on the west side to the spoils building sou Relay perso	e today, except for a few hour moved framework around so processing six Geary trucks which do not be to be hauled to Cleam Hoth approximately 50 feet. Cannel are on site again today.	oth 46 kV terminath material to Cle removed the con larbors. <b>N</b> ewman spital <b>E</b> lectric is in	ation structure can Harbors ( taminated ma n assisted CV n the control b	e and installed 46 6 in the AM and aterial used for b E in excavating building completi	6 kV 6 in the ackfill. for and ng their	
IF WORKING IN ENERG	IZED SUE	STATION:						
Dispatcher login, name and	time:	Gus Montane	ez 0637					
Dispatcher logout, name and	time:	Jim Bovman	1730					
DISCREPANCIES:						VE ACTION TA		
3/23 - Still waiting for the second	d CT termina	al block from H	Hyundai	1	en Foster on 3	/22 that RMP has	not received	
4/9 - Identifed an issue with mor	unting of the	ground blade	es on 150A and 151A	this vet. Sent email and pictures to Roger F and Mike S				
Demo Plan. 12/15 - Excavated to locate the	46 kV cable	s exiting the w	grade and does not show on the	Will excavate to c		ensions.		
didn't find them. Will try again.			deeoer than design of new	<u> </u>				
	delivered,	, idle): dumpster, offic	ce trailer, conex , exclusion zone t, mini-ex , water truck, compact		iiler, crew truck	: CVE Line Crew:	Pickup (2),	
OSHA Recordable Safet	v Inciden	ıte.			Reported	hv	Time:	
COUNT RECOLUTIONS SAIST	y moluen	11.3.	<u> </u>		Tehoirea	July.	Time.	
					<del> </del>			
				<del></del>				

**Rocky Mountain Power** 

Russ Johnson

Field Construction Representative

# PACIFICORP OPERATIONS - Field Construction Representative Daily Log PROJECT NAME: Third West Sub - Rebuild DATE: Wednesday, April 11, 2012 3000078050 / 10035803 MAIN CONTRACTOR: Cache Valley Electric PO & Work Order NO.: 10:10 Crew Start Time: Crew Stop Time: 17:05 Tot Hrs mns: 17:10 FCR Start Time: 6:42 FCR Stop Time: Tot Hrs mns: Use military time format 00:00 WEATHER CONDITIONS: Sunny/Partly Cloudy - 50 degrees in AM, 78 degrees in PM DESCRIPTION: (work performed, general comments, instructions to contractor, # of crew members onsite.) R&R set up four monitors. CVE Fab Crew, working with Newman, set the remainder of the cable trench south to the point that the conduit could be run east across the roadway to the switchgear pullbox. CVE placed conduits, bedded in sand from the cable trench top the switchgear pullbox. Depth of conduit is more shallow than called for in the specs, so I spoke with Roger Fuerst to get OK for the change in depth. It was decided that concrete would be placed over the conduits to help with the depth issue, but leave a minimum of 6" for roadbase on top. CVE Line Crew worked on jumpers to the two west circuit breakers and swapped the position of the two single CCVTs to match SAP # location. They also set anchors for the NW circuit breaker. Newman started excavating for the 138 kV duct bank near the south termination structure. RMP Relay and Comm personnel are on site again today. CVE Line Crew = 4, CVE Fab Crew = 4, Newman = 4, R&R = 1, Wilding = 1. IF WORKING IN ENERGIZED SUBSTATION: Dispatcher login, name and time: Gus Montanez 0642 Dispatcher logout, name and time: Bany Nielson 2000 DISCREPANCIES: IMMEDIATE CORRECTIVE ACTION TAKEN: 3/23 - Still waiting for the second CT terminal block from Hyundai Confirmed with Ken Foster on 3/22 that RMP has not received 4/9 - Identifed an issue with mounting of the ground blades on 150A and 151A Sent email and pictures to Roger F and Mike S 11/30 - Identified an additional retaining wall that is below grade and does not show on the Will excavate to determine dimensions. 12/15 - Excavated to locate the 46 kV cables exiting the west side of the yard. Dug 8' and Sent e-mail to Roger F. didn't find them. Will try again. Actual deoth will be much deeper than design of new DELAYS OR LOST TIME ENCOUNTERED: EQUIPMENT (working, delivered, idle): CVE fab crew: Portable toilet (3), forklift, 1 dumpster, office trailer, conex, exclusion zone conex, (2), tool trailer, crew truck. CVE Line Crew: Pickup (2), JLG (2), tool trailer. Newman: trachoe (2), loader, bobcat, mini-ex, water truck, compactor, backhoe.

OSHA Recordable Safety Incidents: Reported by: Time:

**Rocky Mountain Power** 

Russ Johnson

Field Construction Representative

PROJECT NAME:	Third We	est Sub - Rebuild	DATE : Thur	2012	
PO & Work Order NO. :	3000078	3050 / 10035803	MAIN CONTRACTOR	: Cache Valle	y Electric
Crew Start Time:	6:55	Crew Stop Time:	,	Tot Hrs mns:	17:05
FCR Start Time:	6:42	FCR Stop Time:		Tot Hrs mns:	17:18
Use milifary time format 00:00	V. 12	- CK Otop IIII.o.			
Osc minary and romac solution					
WEATHER CONDITIONS:		Partly Cloudy to Rain -	45 degrees in AM, 40 degr	ees in PM	
DESCRIPTION: (work perfo					
8 through the yard. CVE Line Cr in the 138 kV yard. RMP Relay wilding = 1.					
IF WORKING IN ENERGIZED	SUBSTATION	 I:	<del></del>	<del></del>	
Dispatcher login, name and time:	Gus Monta	nez 0642			
Dispatcher logout, name and time	e: <b>M</b> anny Luh	aun 1730			
DISCREPANCIES:			IMMEDIATE CORRECTI	VE ACTION TA	KEN:
3/23 - Still waiting for the second CT	terminal block from	Hyundai	Confirmed with Ken Foster on 3	/22 that RMP has	not received
4/9 - Identifed an issue with mounting	g of the ground blac	les on 150A and 151A	this vet. Sent S/N to Pascor.		
		:			
11/30 - Identified an additional retain Demo Plan.	ing wall that is belo	w grade and does not show on the	Will excavate to determine dime	ensions.	
12/15 - Excavated to locate the 46 k			Sent e-mail to Roger F.		
didn't find them. Will try again. Actu		ch deeper than design of new			
DELAYS OR LOST TIME EN	COUNTERED:				
			·		
EQUIPMENT (working, deliv	rered, idle):				
CVE tab crew: Portable toilet (3), for JLG (2), tool trailer. Newman: trach	rklift, 1 dumpster, of			c. CVE Line Crew:	Pickup (2),
			`		
		•			
OSHA Recordable Safety In	cidents:		Reported	l bv:	Time:
			<u> </u>		

**Rocky Mountain Power** 

Russ Johnson

Field Construction Representative

PROJECT NAME:	Third West Sub - Rebuild			Frio	Friday, <b>A</b> p <b>r</b> il 13, 2012		
PO & Work Order NO. :	3000078050 / 100	035803	MAIN CONTRACTOR : Cache V		Cache Valle	y Electric	
Crew Start Time: 6	:50	Crew Stop Time:	17:15	; ;	Tot Hrs mns:	10:25	
FCR Start Time: 6	:43	FCR Stop Time:	17:40	)	Tot Hrs mns:	10:57	
Use military time format 00:00		•					
•							
WEATHER CONDITIONS:	Sur	ny/Partly Cloudy - 4	5 degrees in Al	/I, 65 degre	ees in PM		
DESCRIPTION: (work performed	d d <b>en</b> eral commen	ts instructions to	contractor. # o	f crew me	mbers onsite	1	
fiberglass elbows and installed conduit CVE Line Crew installed 1272 jumpers jumpers to the 138 kV breakers. News set the conduits and elbows for the 13 Concrete is on site drilling holes in valuct bank conduits and CVE placed F personnel are on site again today. Me CVE Line Crew = 4, CVE Fab Crew	s from the terminators man excavated for the 8 kV duct bank. Newrults #9 and #10 for the TB over the conduits reting at 11:30 to discu	to the copper tubular to the copper tubular to 138 kV duct bank run man also excavated ea 12 kV conduits. <b>N</b> ewlunning east from the #ss work that will need	ous at the two 46 I ning E-W along th ast of vault #6 and man and CVE pla 66 vault, approxim to be completed	kV terminatone south side installed fo ced 2000 ps ately20 feet	or positions and e of the yard and our 6" conduits. si concrete arour east. RMP Rel	installed d with CVE Miller nd 138 kV lay	
,							
IF WORKING IN ENERGIZED SU	r						
Dispatcher login, name and time:	Ken Barto 0643	<del></del>	<del> </del>				
Dispatcher logout, name and time:  DISCREPANCIES:	Jim Bowman 1740		IMMEDIATE CO	PRECTIV	E ACTION TA	KEN.	
3/23 - Sfill waiting for the second CT termin	nal block from Hyundai		Confirmed with Ker				
			this vet.				
4/9 - Identifed an issue with mounting of the	e ground blades on 150/	and 151A	Sent S/N to Pascor.				
			NAPIL				
11/30 - Identified an additional retaining was	all that is below grade an	a ages not snow on the	vviii excavate to de	termine alme	nsjons.		
12/15 - Excavated to locate the 46 kV cable didn't find them. Will try again. Actual dec			Sent e-mail to Roge	er F.			
DELAYS OR LOST TIME ENCOU	INTERED:	ngir design of new					
EQUIPMENT (working, delivered	l, idle):						
CVE fab crew: Portable toilet (3), forklift, 1 JLG (2), tool trailer. Newman: trachoe (2)				er, crew truck.	. CVE Line Crew:	Pickup (2),	
OSHA Recordable Safety Incide	nts:		· · · · · · · · · · · · · · · · · · ·	Reported	by:	Time:	
		<del> </del>	•				
	<del> </del>	<del></del>	<del></del>		,		

**Rocky Mountain Power** 

Russ Johnson

Field Construction Representative

PROJECT NAME:	Third West Sub - Rebuild			DATE :	Satu	Saturday, April 14, 2012		
PO & Work Order NO. :		30000780	50 / 10035803	MAIN CONT	RACTOR	: Cache Valle	y Electric	
Crew Start Time:	6	:50	Crew Stop Time:	17:30	)	Tot Hrs mns:	10:40	
FCR Start Time:	6	:43	FCR Stop Time:	17:50	)	Tot Hrs mns:	11:07	
Use military time format 00:			1 01(010) 1					
Ose minut y ame romat ou.	•							
WEATHER CONDITIONS	:		Rain/Partly Cloudy - 4	0 degrees in AN	l, 50 degre	es in PM		
DESCRIPTION: (work pe								
R&R set up four monitors. CV placed 20 cyds of 2000 psi co out and installed ground rods excavating for the 138 kV duc 46 kV yard. CVE Line Crew	ncrete ov and 4/0 v t bank ar	ver/around the wire in the nort nd installed co	138 kV duct bank. CVE Ele th end of the yard (around the nduits. They got to the point	ctrical Crew piped e control building a where the duct ba	into the #2 and vaults). ank turns no	Xfmr. CVE Line Newman continer on the west s	Crew laid ued	
IF WORKING IN ENERGIZ	ZED SU	BSTATION:						
Dispatcher login, name and tir		Earl McGlore	0643				1	
Dispatcher logout, name and		Eari McGlore						
DISCREPANCIES:		•		IMMEDIATE C	ORRECTI	VE ACTION TA	KEN:	
3/23 - Still waiting for the second	CT termir	nal block from H	yundai	Confirmed with Ke this yet.	n Foster on 3	/22 that RMP has	not received	
4/9 - Identifed an issue with mour	nting of th	e ground blades	on 150A and 151A	Sent S/N to Pasco	r.			
11/30 - Identified an additional re-	taining wa	all that is below	grade and does not show on the	Will excavate to de	etermine dime	ensions.		
12/15 - Excavated to locate the 4 didn't find them. Will try again. A				Sent e-mail to Roger F.				
DELAYS OR LOST TIME								
<b>EQUIPMENT</b> (working, de	elivered	l, idle):						
CVE fab crew: Portable toilet (3) JLG (2), tool trailer. Newman: tr	, forklift, 1	dumpster, offic			er, crew truck	CVE Line Crew	Pickup (2),	
OSHA Recordable Safety	Incido	nte:			Reported	l by:	I	
Con A Necordable Safety	inclue	1113.			Vehousen	. ∠y.		
		·		_		· · · · · · · · · · · · · · · · · · ·	<u> </u>	
L				<del></del>				

**Rocky Mountain Power** 

Russ Johnson

Field Construction Representative



April 11, 2012

Laboratory Code:

RES

Subcontract Number:

NA

Laboratory Report: Project # / P.O. #

RES 233392-1 None Given

Project Description:

3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233392-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described In this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer Orr

President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

## TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233392-1

Client:

R & R Environmental None Given

Client Project Number / P.O.: Client Project Description: Date Samples Received:

3rd West Sub - RMP

Analysis Type:

April 10, 2012

Turnaround:

TEM, AHERA

24 Hour

Date Samples Analyzed:

April 11, 2012

Client	Lab		Area	Air	Number of	Analytical	Asbestos	Filter
ID Number	ID N	umber	Analyzed	alyzed Volume Asbestos Sensitivity Sampled Structures Detected		Sensitivity	Concentration	Loading
			(mm²)	(L)		(s/cc)	(s/cc)	(s/mm²)
3W-040912 W	EM	876 <b>243</b>	0.0900	909	ND	0.0047	BAS	BAS
3W-040912 N	EM	876244	0.0900	909	ND	0.0047	BAS	BAS
3W-040912 E	EM	876 <b>24</b> 5	0.0900	909	ND	0.0047	BAS	BAS
3W-040912 S	EM	876246	0.0900	907	ND	0.0047	BAS	BAS

NA = Not Analyzed

Filter Material = Mixed Cellulose Ester

ND = None Detected

Filter Diameter = 25 mm

BAS = Below Analytical Sensitivity Average Grid Opening in mm<sup>2</sup> = 0.010

Effective Filter Area = 385 sq mm

Due	Date:_	4-11.12
	Time:	825-

# REILAB RESCENSIFS ENVIRONMENTENT, INC. 8801 Logan St. Danver, CO 80216 - Ph; 303 864-1886 - Fax 303-477-4273 - Tot Free :886 RESI-ENV

of\_ Pager: 303-509-2098 INVOICE TO: (IF DIFFERENT) **CONTACT INFORMATION:** 

Company: Kick Euronmend	Company:			Contact Dave 1205 kelley Contact:																		
Address: 47 W 90005 #2	Address;					Phone:					Pho	Phona:										
Sandy U. 84070						Fex:						Fax:										
						Cell/pogor: 801 541 ~ 1035 CaR/bagar.																
Project Number and/or P.O. It:						Final Data Delivarable Email Address:  dowler newing. www.																
Project Description/Losation: 30d West Sulp - RAAD							av	<u>e</u> e	<u> </u>	ren	n	<u>9.0</u>	7000									
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PLM / PCM / (TEM) RUSH (Same Day) X PRIORNY (Next Day	)STANDARD	T						T	Т	П		П	!		Air	= A		E	Bulk = B			
(Rush PCM = 2hr, TEM = 6hr.)		JI			11			11	1			$\  \cdot \ $			Dust	= D		Р	aint = P	<u>ب.</u>	Z_	
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - Spm		] [			-1-1				1	$  \  $					Soil	<b>=</b> \$		W	/ipe = W		efu	<b>L</b>
Metal(s) / Dust RUSH 24 hr3-5 Day	**Prior notification ta		Ĕ						_					-	Swab		-		= Food	<u> </u> '	<u> </u>	
RCRA 8 / Metals & Welding RUSH 5 day10 day	raquirad for RUSH	ğ	Quant	}		Sca			ig.	П	İ		į	Drin	king W	aler =			Water = WW			
I dille ocali / for	turnarounds.**	Point Count	÷ 8			S.	8					}	NOTES	-	OTD4 6		O = Other			<del> </del>		
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MICROBIOLOGY LABORATORY HOURS: Weekdays; Sam - 6ptr E.coll O157:H7, Coliforms, 3.aureus 24 hr2 Day	1 3-5 Day	ఠ	<sup>2</sup> 월	4	11	َ ۋ	1		১	į į	<u>s</u>   <u>s</u>	듍	OTHER		-	1						
Salmonella, Listeria, E.coli, APC, Y & M 48 Hr3-5 Day	<b>—</b> ' ',	Long rep	돌절	SHA !	ϼ│ │	ing Fume,			+	tige		diffic.								<del> </del>		<del></del>
	48 Hr S Day 5 Day	١٤	= ×		yte(s)	g.		<b>\$</b>	빝	E G	ত ১ ১	2	SOR	1								
"Turnaround times establish a laboratory priority, subject to laboratory volume and an	<del></del>	ह	١٥٩	74008	\$   \$	₹   ₹	Ĕ Ì≱	6	3	১	ة إذ	8	INITIALS		-		ł		ł	-		
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		•	- 호	٠ ] .	<u>:   ĕ</u>	RCRA 8,	NA P	8	8 5	8 3	8 8	8	1	Sample	٤ ]	d de	ا م	Date	Time		Use Or	
Client sample ID number (Sample ID's must be unique	)idela e e e e e e e e e e e e e e e e e e	差	E E	PCM I	METALS	ပ္ကို မွ	8	A	AICRO	ЭВЮ	LOGI	, , , ,	3	b	(L)	#	mg	lected p/dd/yy	Collected hh/mm a/p			
1 3W-040912W			X		$\top$			П		П		П		190	9/	$H_{-}$	4/0	reliz		25	76	243
2 3W-040912N			T				1					П		90	1			T				44
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4 3W-040917 S			$\mathbf{L}$	15.	11:4-						1			90	7			1		1	,	40
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6											1				. : ] :			1.525				
7								Ħ		П												
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9				-	-	T.	$\Box$	П	Т			П										
10		- 1								:	T			100					Epochier			
Number of samples received: (Addition	nal samples shall be listed on	attach	ed lon	g form	n.)										•	_		<del></del>				·
NOTE: REI will analyza incoming samples based upon information received and will not be re analysis as indicated on this Chain of Cystody shall constitute an analytical services agreeme															ativa ag	rees th	iat subm	nission of	the following sa	mples for r	Bquestec	
1-4-51/.	FedEx			-		/	09/	10						Ī								
	e/Time: 4/0120	3	25-		Car	rier:	ţ	è	<u>-ŀ₹</u>	<u>&gt;∼</u>	<u>:</u>				emp.	(F°)		Y	es/No Y	es / No 	CYB	No
Results: Contact Phone Email Fax Date	ults: Contact Phone Email Fax Date Time Initials Contact Phone Email Fax Date 4-LL12 Time 1 x2 == Initials																					
Contact Phone Email Fax Date	Time Initia	als	Con	tact			Pl	hone	Ema	il Fa	X			Date				Tim	ie	Initi	aks	أإ

\*17934 J44 2728 7-2011\_version 1

# Attachment I

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type

# Structure Types

Α	=	Amosite	F =	Fiber
An	=	Anthophyllite	<b>B</b> =	Bundle
C	=	Chrysotile	C =	Cluster
Cr	=	Crocidolite	M =	Matrix
T	=	Tremolite		

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

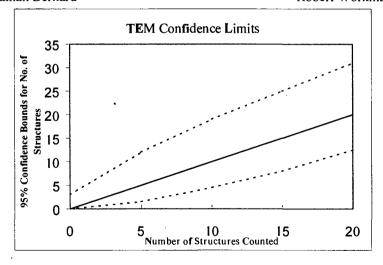
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

# **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc. TEM Astrestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX N S
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	·
QA Type	

Client :	R+R
Sample Tyoe (A=Alr, D=Dust):	A
Air volume (L) or dust area (cm2)	909
Date received by lab	4/10/12
Lab Job Number:	233392
Lab Sample Number:	876243

Analyzed by	JB
Analysis date	4/11/12
Method (D=Dlrect, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps	Only):
Fraction of primary filter used	
Total Resuspsnsion Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure	No. of Str	nctures	Oimer	nsions	Identification	Mineral Class				1 = y	es, blank	= no
Sild	Cha Opering	Туре	Primary	Total	Length	Width	, acritimodilori	Amphibole	С	NAtvi	Sketch/Comments	Sketch	Photo	EDS
A	43-3	MD												
	F3-3	ND								ļ <u>.</u>			,	
	E3-1	ND							/					<u></u>
	C3-1	ND			P.	D 1	1-13	~ 80%	mt	unf 3	- Stock	n's		
	B3-1	ND				<i>I</i> 								
B	H3-4	ND				·			3	Hulis				
	G34	ND						//		1.				
	F3-4	ND				:								
	E3-4	ND												

# Reservoirs Environmental, Inc. TEM Asbestos Strueture Count

Laboratory name:	REI
Instrument	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnification	20iO 10KX
Grid openina area (mm2)	0.01
Scale: 1L ≈	0,28 um
Scale: 1D =	. 0.056 um
Primary lilter area (mm2)	385
Secondary Filter Area (mm2)	·
QA Type	

Client :	R+R
Sample Type (A=Air, D=Dust):	A
Air yolume (L) or dust area (cm2)	909
Date received by lab	4/10/12
Lab Job Number:	233392
Lab Sample Number:	876244

Analyzed by	JB
Analysis date	4/11/12
Method (D=Dlrect, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Montfi Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):					
Fraction of primary filter used					
Total Resuspension Volume (ml)					
Volume Applied to secondary filter (ml)					

Grid	Grid Opening	Structure			Dimensions		Identification	Mineral Class				1 = y	es, blank	≃ no
		Туре	Primary	Total	Length	Width		Amphibole	C NAM		Sketch/Comments	Sketch	Photo	EDS
A	G3-6	ND.												
	F3-6	ND				Prep	<b>A</b> =	70% into	uf	5	La debris			
	E3-6	VD				Pup	3~	4						
	C3-6	ND.					11							
	B3-6	ND					(B)	4/1/12						
B	Carlo	MD					//			<u> </u>				
	F2-6	MD			i			· ·	 		·			
	EZ-6	ND												
	C2-6	MD						<u> </u>						

# Reservoirs Environmental, Inc. TEM Aspestos Structure Count

Laboratory name:	REi
instrument	JEOL 100 CX N S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client :	RXR
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	909
Date received by lab	4/10/12
Lab Job Number:	233392
Lab Sample Number:	876245

F-Factor Calculation (Indirect Preps	Only):
Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (mi)	·

Analyzed by	JB
Analysis date	4/11/12
Method (D=Direct, I=Indirect, IA=IndirecL ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Strcture			Dimensions		Identification	Mineral Class				1 = yes, blank = no		= no
	- III Opoliiiig	Туре	Primary	Total	Length	Width	TOCH MINOCHOT	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	K4-6	ND											·	
	H4-6	MD			R	ep X	70	Loistens	ے ا	2/0	lebra			
	G46	M			P.	2 0	CO	% in trut	5	%	lebr15			
	H4-4	ND				7		16						
	Herl	ND						43	4/4	12				
B	H2-6	ND				:		//	1/1					
	G2-6	ND						`						
		ND										· .		
	E2-6	3					•							

# Reservoirs Environmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instmment	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 10 =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	<u></u>
QA Type	·

RXR
A
907
4/10/12
233392
876246

F-Factor Calculation (indirect Preps	Only):
Fraction of primary filter used	
Total Resuspension Volume (mi)	
Volume Applied to Secondary filler (ml)	

Analyzed by	JB
Analysis date	4/11/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
Counting rules (ISO, AHERA, ASTM)	· AH
Grid storage location	Month Analyzed
Scope Allgnment	Date Analyzed

Grid	Grid Opening	Stmcture	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = yes, blank = no		
Cild	Ond Opening	Туре	Primary	Total	Length	Width	Identification	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	KZ-3	MD												
	H2-3	ND			Pm	人	80%	in but	5%	delse	1'5			
	G2-3	ND			Par	B	ansi	in tent	5%	dela	<u>'S</u>			
	F2-3	ND										,		
	EZ-3	ND					1	B 4/11/1	Z					
3	H2-6	ND					/	77						L
	G2-6	GN.						`						
	F2-6	ND												
	E2-6	2												
														i

# Analytical Procedures - AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

Bundle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

## **Equations Used for Calculations**

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration,  $s/cc = \frac{\# \ Asbestos \ Structures}{\# \ GO \ Counted} \ x \ \frac{1}{Volume \ (L)} \ x \ \frac{Eff. \ Filter \ Area \ (mm^2)}{Average \ GO \ area \ (mm^2)} \ x \ \frac{1L}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> = # Asbestos structures Area Analyzed (mm<sup>2</sup>)

GO = TEM grid opening



April 12, 2012

Laboratory Code:

RES

Subcontract Number:

NA RES 233475-1

Laboratory Report: Project # / P.O. #

None Given

Project Description:

3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233475-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely.

Jeanne Spencer Orr

President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

# TABLE 1. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233475-1

Client:

R & R Environmental

Client Project Number / P.O.:

None Given

Client Project Description:

3rd West Sub - RMP

Date Samples Received:

April 11, 2012

Analysis Type:

TEM, AHERA

Turnaround:

24 Hour

Date Samples Analyzed:

April 12, 2012

Client ID Number	Lab ID Number		Area Analyzed			f Analytical s Sensitivity s	Asbestos Concentration	Filter Loading	
			(mm²)	(L)	Detecte	(s/cc)	(s/cc)	(s/mm²)	
3W-041012 W	EM	876407	0.0800	983	NI	D 0.0049	BAS	BAS	
3W-041012 N	EM	876408	0.0800	981	NI	D 0.0049	BAS	BAS	
3W-041012 E	EM	876409	0.0800	979	• NI	D 0.0049	BAS	BAS	
3W-041012 S	EM	876410	0.0800	979	NI	D 0.0049	BAS	BAS	

NA = Not Analyzed

ND = None Detected

BAS = Below Analytical Sensitivity

Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Ester

Filter Diameter = 25 mm

Effective Filter Area = 385 sq mm

DATA QA

Due Date:_	4.12.12
Due Time:	a chapm

# RESILAB RESERVOIFS Environmental, Inc. 5801 Logan 3L Dmivsr, CO 80216 · Ph; 303 994-1986 · Fax 303-477-4279 · Toll Free :888 RESI-ENV

Page 1 of (

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Company: 0	P Emmonmental	Company	INVOICE TO: (IF DIFFERENT)								ellex	_		JIII A	CT INFORMATION:							
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	nd Us. 84043					Fa	x:									Fax						
	· oy · w· · 0·10·12					Ce	Првде	800	54	11-11	774					Coly	pager.					
Project Number	and/or P.Q. #:	<del>_</del>					ıal Dat	a Delive	abla E	mali Ad	dress:				_							
Project Description	icrocation 319 West Sub - RNIP						<u>d</u>	ave	<u>e r</u>	ren	Nico	<u>- (10</u>	<u> </u>									
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	(Rush PCM = 2hr, TEM = 5hr.)					11	1			1 }	11				Dust	≠ D		Pa	inl = P			
CHEMIST	RY LABORATORY HOURS: Weekdays: Sain - 5pm		]			11	1			11		-	1		Soil	= S		Wi	pe = W			
Metal(s) / D	oustRUSH 24 hr3-5 Day			Ę			1			_				s	wab	= SW		F:	= Food			
		**Prior notification is required for RUSH	벌	ð		a			<u>ا</u>			۶	<u> </u>	Drlnki	king Water =		DW Waste		<u>Vater = WW</u>			
Fume Scan	/TCLP	turnarounds.**	8		1	Metals Scan			غُ ا		11	3	3 2	<u></u>			0 = OI					
Organics	24 hr 3 day5 Day		Point Count	i gr gr		Ē			·	Š	5 S	3	NOTES	"At	TME	1792	approved	d wipe media only**		┦—		
	OLOGY LABORATORY HOURS: Weekdays: 9am - 6		[ -	S. 35			1		١,	<u> </u>	fication	툂	OTHER	1			İ	ļ	ì	L		
1	7:H7, Coliforms, S.aureus24 hr2 Da		8	5 E	SHA F	ding Fume.				, ig	量量	1 gg	5 6	ł			Ì		l	-		
	ı, Listeria, E.colf, APC, Y & M48 Hr3-5 i		66	<u>.</u> 0		[   E	,		:	. 8	라   하		5 8					- 1		<u> </u>		
Mold	<del></del>	48 Hr3 Day5 Day_	171	evel -vac	7400B.	(S) B	1	1.			ਰ ਰ	ō١	8 2	1		1	Ì	1	ĺ	1-		
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Laborato	ory Use Opty	(11.0		اسم										Temp. (F°)					Yes / No Yes / No			
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# **Attachment I**

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type A = Amosite An = Anthophyllite C = Chrysotile Cr = Crocidolite Structure Types F = Fiber B = Bundle C = Cluster M = Matrix

T = Tremolite

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

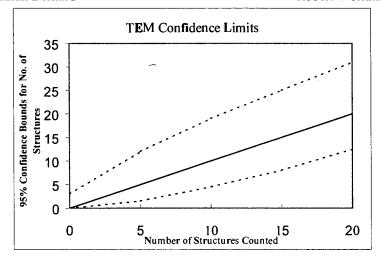
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

## **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Laboratory name:	REI
Instrument	JEOL 100 CX (N)S
Voltaae (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filler Area (mm2)	
QA Type	

Client:	RTR
Sample Type (A=Air, D=Dust):	A.
Air volume (L) or dust area (cm2)	983
Oate received by lab	4/11/12
Lab Job Number	233475
Lab Sample Number	876407

F-Factor Calculation (Indirect Preps	Only):	
Fraction of primary filter used		
Total Resuspension Volume (ml)		
Volume Applied to secondary filter (ml)		

Analyzed by	JB
Analysis date	4/12/12
Method (D=Direct, I=Indirect, tA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure	No. of Str	octures	Dimer	nsions	Identification	Mineral Class	· • · · ·			1 = ye	es, blank	= no
		Туре	Primary	Total	Length	Width		Amphibole	С	NAM	Sketcft/Comments	Sketch	Photo	EDS
A	E2-6	ND												
	C2-6	ND			Pre	o A	706	rabant	5%	deb	ひと			
	B2-6	ND			Pce	0	60%	l/	5%	L .				_
	B4-4	QV Qv	v					,		-				
B	E4-4	d d						1B4	1/2/1	2				
	C4-4	ND							7					
	B4-4	CN												
	A4-4	Q.							: -		·			
												1		
							,							

Laboratory name:	REI
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.26 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

RYR
A
981
4/11/12
233475
876408

Analyzed by	JB
Analysis date	4/12/12
Method (D=Direct, I=Indlrect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignmetit	Oale Analyzed

Fraction of primary filter usad	
Total Resuspension Volume (ml)	-
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure	No. of Structures		Dimensions		Identification	Mineral Class			_	1 = yes, blank = no		
0.1.0	Cita Operating	Туре	Primary	Total	Length	Width	i derimidation	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	H4-4	ND												
	G4-4	ND				PM	o X	70% into	nt	5%	achris			
	F4-4	ND				P~	o B	かんいか	ent.	1 *	debnis			
	E3-3	ND						4.						
B	F3-1	ND					1	B 4/12/12		<u> </u>				
	E3-1	ND					//	//						
	C3-1	ND			<u> </u>						· · · · · · · · · · · · · · · · · · ·			
	133-1	ND		,	<u>.</u>			,						
	·				<u> </u>									

Laboratory nama:	REI
Instrument	JEOL 100 CX (N)S
Voltage (KV)	100 KV
Magnification	(20KX) IOKX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area	383
(mm2) QA Type	

Client:	Rock
Sample Tyoe (A=Air, D=Dust):	A
Air yolume (L) or dust area (cm2)	979
Date received by lab	4/11/12
Lab Job Number:	233475
Lab Sample Number:	876409

Analyzed by	JB
Analysis date	4/12/12
Method (D=Direct, !=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps	Only):
Fraction of primaty filter used	
Total Resuspension Voluma (mi)	
Volume Applied to secondary filter (mi)	

Grid	Grid Opening	Structure	No. of Str	uctures	Dimer	nsions	Identification	Mineral Class				1 = yes, blank = no			
0.14	Ond Opening	Туре	Primary Total		Total Length Width		100111111000011	Amphibole	С	NAM	Sketch/Comments	Sketch	Pholo	EDS	
A	G2-6	ND		· 											
	F2-6	ND		L	6	no A	St	Thein ha	+	3-5	Labor!	<b>.</b>			
	EZ-60	ND			E	rest	5 70	four tant		3-5	Lo de buis	<u> </u>			
	CZ-60	ND													
B	E2-4	ND						43	4/12	12					
	C2-4	ND							7 1						
	c3-3	ND				1									
	1333	ND													
											·				

Month Analyzed

Date Analyzed

# Reservoirs Environmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX (N)S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2) Secondary Filter Area (mm2)	385
QA Type	

Client:	RTR
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	974
Date received by lab	4/11/12
Lab Job Number:	233475
Lab Sample Number:	876410

Counting mies (ISO, AHERA, AS1
Grid storage location
Scope Alignment
•

Analyzed by

Analysis date
Melhod (D=Dlrect, I=Indirect, 1A=Indirect,

F-Faotor Calculation (Indirect Preps Only):								
Fraction of primary filter used								
Total Resuspension Volume (ml)								
Volume Applied to secondary filter (ml)								

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = ye	es, blank	= no
Giid	Grid Operang	Туре	Primary	Total	Length	Width	Identification	Amphibole	С_	NAM	Sketch/Comments	Sketch	Photo	EDS
A	H3-4	ND			,									
	G3-4	ND				Paul	A 7	0% 10 La	, 4	7-10	% debri	S		
	F3-4	ND				Pre	0 B 25	D'hintan	4	7-10	% delosis			
	E3-4	MD				1								
B	H3-1	ND						AB 4	1/2/12					
	G3-1	ND		,				1	/					
	F3-1	NO												
	E3-1	ND												
				·										

### Analytical Procedures - AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

Bundle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### **Equations Used for Calculations**

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration, s/cc =  $\frac{\text{\# Asbestos Structures}}{\text{\# GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{1L}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> = # Asbestos structures Area Analyzed (mm<sup>2</sup>)

GO = TEM grid opening



April 13, 2012

Laboratory Code:

RES NA

Subcontract Number: Laboratory Report:

RES 233578-1

Project # / P.O. #
Project Description:

None Given
3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. Is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233578-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely.

Jeanne Spencer Orr

President

### RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

### TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233578-1

Client:

R & R Environmental

Client Project Number / P.O.:

None Given

Client Project Description:

3rd West Sub - RMP

Date Samples Received:

April 12, 2012

Analysis Type:

TEM, AHERA

Turnaround:

24 Hour

Date Samples Analyzed:

April 13, 2012

Client ID Number	Lab ID Ni	umber	Area Analyzed	Air Volume Sampled	Number of Asbestos Structures Detected	Analytical Sensitivity	Asbestos Concentration	Filter Loading
			(mm²)	(L)		(s/cc)	(s/cc)	(s/mm²)
3W-041112 W	EM	876576	0.0900	927	ND	0.0046	BAS	BAS
3W-041112 N	, EM	876577	0.0900	927	ND	0.0046	BAS	BAS
3W-041112 E	EM	876578	NA	929	NA	Rejected	due to Uneven Filter L	oading
3W-041112 S	EM	876579	0.0900	929	ND	0,0046	BAS	BAS

NA = Not Analyzed

ND = None Detected

BAS = Below Analytical Sensitivity

Average Grid Opening in mm<sup>2</sup> = 0.010

Filter Material = Mixed Cellulose Estér

Filter Diameter = 25 mm

Effective Filter Area = 385 sq mm

DATA QA

Due Date:_	4.13.15
Due Time:	85Ø~

# REILAB RESERVOIRS ENVIRONMENTAL, INC... 880 | Logen St. Denver, CO 80216 • Ptt; 303 864-1986 • Fax 303 477-4276 • Toll Free :866 RESI-ENV

Page 1 of

	Pager : 303-509 INVOICE TO: (IF		EREN'	T)									C	ONTAC	T IN	FOR	MATION	<b>1</b> :				
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Address: 47 W 9000 S #2	Address:				Pho	Phone:									Phon	Phone:						
Sandy, Us 84070							Fax									Fax:						
						Coll/pager: 801 541-W35										Collipager:						
Project Numbw sed/or P.O. #:						Final Data Doliverable Email Address:  dave @ Wenyiro.com																
Project Description Location: 35° West Sub - RMP						_0	ave	· @	M.	'My	WO.	<u>යා</u>	<u> </u>									
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E.coli O157:H7, Coliforms, S.aureus 24 hr 2 Day	3-5 Day	Long report,	30-tro	8 8 8	Š			.	ig .	Quantifica	Quantification	١٤	6	)								
Salmonella, Listeria, E.coli, APC, Y & M48 Hr3-5 Day	1	6			l g	ĺΙ			T TE	o G	3 5	ig i	Š	1						<b></b> _		
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**Turnaround times establish a faboratory priority, subject to laboratory volume and ar apply for afterhours, weekends and holidays.**.	e not guaranteed. Additional fees				- Analyte(s) TCLP, Welding Fume,	ORGANICS - METH	amonella: +/. coli O157:H7:	<b>‡</b>	5 S	÷ 7	÷ 5	Mold: +/-, Identification, Quantification		Sample Volume (L.) / Area	ر ا	2					e etyek k	
Special Instructions:		S S	Want, Mic	Total.	8, TO	SUCS	Salmonella: E.coli 0157:	-/+ :everie: +/-	흥흥	ğ.	Y & M: +	÷	E.	) e	Matrix Code	Containers	Date		Time		<b>ber</b> (Laboratory	
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Client sample ID number (Sample ID's must be unique		<u> </u>	<del>- 8   8</del>	<u> </u>	ΣŒ	0	7 7	MICI	ROBI	DLOG	3Y	<del>, -   '</del>	<u> </u>		_	*	mm/adiyy	<u>/ hi</u>	n/mm a/p			
13W7041112W			$\sim$ $\perp$		-			H	+-		+			927			4/4/12			87	€276	
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analysis as indicated on this Chain of Custody shall constitute an analytical services agreeme		, tanura	to comp	y with p		11		un a	1.0%	monu	ijy inta	itas: a	ricuard	<u>.                                    </u>					<del></del>	<del></del>		
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Contact Phone Email Fax Date	Tims Initia	nie ——	Conta	act			Phone	e En	nail I	Fax				Date			7	ime		Initial	3	

# **Attachment I**

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type

# Structure Types

<b>A</b> =	Amosite	F =	Fiber
An =	Anthophyllite	$\mathbf{B} =$	Bundle
C =	Chrysotile	C =	Cluster
Cr =	Crocidolite	M =	Matrix
T =	Tremolite		

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

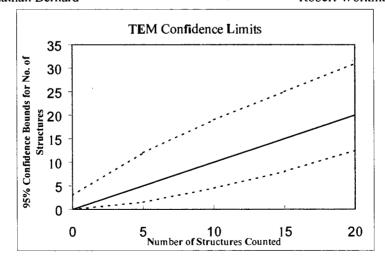
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

# **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Laboratory name:	REI
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Maanification	20KX 10KX
Grid openina area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary fiiter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client :	Rak
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	927
Date received by lab	4/12/12
Lab Job Number:	233578
Lab Sample Number:	876576

F-Factor Calculation (Indirect Preps Only):						
Fraction of primary filter used						
Total Resuspension Volume (mi)	:					
Volume Applied to secondary filter (ml)	:					

Analyzed by	78
Analysis date	4/13/2
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storaae location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	rid Grid Opening Structure		No. of Str	uctures	Dimer	nsions	Identification	Mineral Class			· ·	1 = yo	es, blank	= no
Gila	Grid Operating	Туре	Primary	Total	Length	Width	Identinoation	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	13-1	ND						; :						
	K3-1	ND		·	Par	A	80	Toin tan	4	5%	debris			
	H3-1	ND		•	Pur	B	50	hoinbut	١ .	-0/	debnis			
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	E3-1	ND			•			SB 4	1/13/12	2	,		,	
B	K3-4	ND												
	H3-4	ND					•							·
	G3-4	ND						:						
	F3-4	ND												•
								1						

Laboratory name:	REI
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Magnification	20) <del>00</del> 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Clare Count
R+R
A
927
4/12/12
233578
876577

F-Factor Calculation (Indirect Preps Only):						
Fraction of primary fitter used						
Total Resuspension Volume (ml)	:					
Volume Applied to secondary filter (ml)						

Analyzed by	JB
Analysis date	4/13/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	Ď
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class			1 = ye	s, blank	= no	
Gild	Grid Opening	Туро	Primary	Total	Length	Width	Identification	Amphiboie	С	NAM	Sketch/Comments	Sketch	Photo	EDS
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	E3-1	3				Bq.								
					'			:						

Laboratory name:	REi
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Magnification	2010 10KX
Grid openina area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

etale Count
R+R
A
929
4/12/12
233578
876578

Analyzed by	JB
Analysis date	4/13/12
Method (D=Direct, I=IndIrect, IA=Indirect, ashed)	D'
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):								
Fraction of primary filter used								
Total Resuspension Volume (ml)								
Volume Applied to secondary filter (mi)	: -							

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = y	1 = yes, blank = no			
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	<del></del>
Laboratory name:	REI
Instrument	JEOL 100 CX (N)S
Voltage (KV)	100 KV
Maanification	2010 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

7 Lin Astesios Out	Oth O Colin
Client :	RHR
Sample Tyoe (A=Air, D=Dust):	A
A r volume (L) or dust area (cm2)	929
Oate received by lab	4/12/12
Lab Job Number:	233578
Lab Sample Number:	876579

F-Factor Calculation (Indirect Preps C	Only):	
Fraction of primary filter used		
Total Resuspension Volume (ml)	:	
Volume Applied to secondary filter (ml)		

Analyzed by	JB
Analysis date	4/13/12
Method (D=Direct, l=Indirect, lA=Indirect, ashed)	Φ.
Counting rules (ISO, AHERA, ASTM)	Art
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = ye	es, blank	= no
014	Ond Opening	Туре	Primary	Total	Length	Width	identification	Amphibole C		NAM	Sketch/Comments	Sketch	Photo	EDS
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### Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

**B**undle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

# **Equations Used for Calculations**

Area Analyzed,  $mm^2 = \# GO \text{ counted } x \text{ Average } GO \text{ Area } (mm)$ 

Concentration,  $s/cc = \frac{\text{\# Asbestos Structures}}{\text{\# GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{1L}{1000cc}$ 

Filter loading,  $s/mm^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2)}$ 

GO = TEM grid opening



April 16, 2012

Laboratory Code:

RES

Subcontract Number:

NA

Laboratory Report: Project # / P.O. #

RES 233697-1 None **G**iven

Project Description:

3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233697-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely.

Jeanne Spencer Orr

President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

# TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233697-1

Client:

R & R Environmental

Client Project Number / P.O.:

None Given

Client Project Description: Date Samples Received:

3rd West Sub - RMP

April 13, 2012

Analysis Type:

TEM, AHERA

Turnaround:

24 Hour

Date Samples Analyzed:

April 14, 2012

Client	Lab	Area	Air	Number of	Analytical	Asbestos	Filter
ID Number	Sampled Stru		Asbestos Structures Detected	Sensitivity	Concentration	Loading	
		(mm²)	(L)		(s/cc)	(s/cc)	(s/mm²)
3W-041212 W	EM 876	890 0.1000	833	ND	0.0046	BAS	BAS
3W-041212 N	EM 876	891 0.1000	833	ND	0.0046	B <b>AS</b>	B <b>AS</b>
3W-041212 E	EM 876	89 <b>2</b> 0.0000	831	NA	Rejected [	Due To Uneven Filter	Loading
3W-041212 S	EM 876	893 0.1000	831	ND	0.0046	BAS	BAS

NA = Not Analyzed

Filter Material = Mixed Cellulose Ester

ND = None Detected

Filter Diameter = 25 mm

BAS = Below Analytical Sensitivity Average Grid Opening in mm<sup>2</sup> = 0.010

Effective Filter Area = 385 sq mm

DATA QA

Due Date:_	4-14-12
Due Time:	JEST

# REILAB RESERVITES ENVIRONMENTAL, INC.. SSOI Logan SL Denver, CO 80216 • Ph: 303 984-1886 • Fax 303-477-427\$ • Toil Free :966 RESI-ENV

Page \_\_1\_\_ of \_\_'

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# **Attachment I**

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type A = Amosite An = Anthophyllite C = Chrysotile Cr = Crocidolite Cr = Tremolite Structure Types F = Fiber B = Bundle C = Cluster M = Matrix

ND = no structures detected

= other structure associated with a matrix

NAM = Non Asbestos Mineral

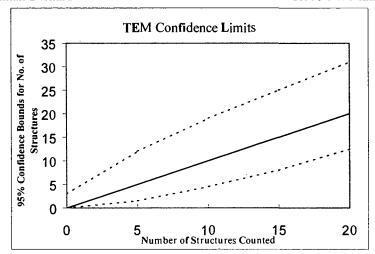
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

# **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	20KX JOKX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D=	0.058 um
Primary fitter area (mm2)	385
Secondary Filter Area (mm2)	
QA Tyoe	

Client :	RIP
Sample Type (A=Air, D=Dusf):	A
Air volume (L) or dust area (cm2)	833
Date received by lab	4/14/12
Lab Job Number:	233697
Lab Sample Number:	876890

Analyzed by	M
Analysis date	4/14/12
Method (D=Oirect, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage tocation	Month Analyzed
Scope Allgnment	Date Analyzed

F-Factor Calculation (Intlirect Preps Only):					
Fraction of primary filter used					
Total Resuspension Volume (ml)					
Volume Applied to secondary filter (ml)					

Grid	Grid Opening	Structure	No. of Str	uctures	Oime	nsions	Identification	Mineral Class				1 = y	es, blank	= no
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Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltaae (KV)	100 KV
Magnification	<u>гокх</u> окх
Grid opening atea (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D=	0.056 um
Primary filter area (rhm2)	385
Secondaty Filter Area (mm2)	
QA Tyoe	

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F-Factor Calculation (Indirect Preps	Only):
Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filtsr (m()	

Analyzed by	M
Analysis date	4/14/12
Method (D=Direct, 1=Indirect, IA=Indirect, ashed)	$\mathcal{D}$
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Strature	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = y	es, blank	= no
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	EM-3	8												

Laboratory name:	REI
Instmment	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	20KX JOKX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client:	RHR
Sample Type (A=Alr, D=Dust):	A.
Air volume (L) or dust area (cm2)	831
Date received by lab	4/14/12
Lab Job Number:	233697
Lab Sample Numben	876893

Analyzed by	M
Analysis date	4/14/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	$\mathcal{D}$
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Dale Analyzed

F-Factor Calculation (Indirect Preps	Only):
Fraction of primery filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Strncture	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = y	es, blank	= no
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# Analytical Procedures - AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is detennined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

**B**undle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### **Equations Used for Calculations**

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration,  $s/cc = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{\text{IL}}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> = # Asbestos structures Area Analyzed (mm<sup>2</sup>)

GO = TEM grid opening



April 17, 2012

Laboratory Code:

RES

Subcontract Number:

NA

Laboratory Report: Project # / P.O. #

RES 233804-1 None Given

Project Description:

3rd West Sub - RMP

David Roskelley R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233804-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer Orr

President

### RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

# TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233804-1

Client:

R & R Environmental

Client Project Number / P.O.:

None Given

Client Project Description:

3rd West Sub - RMP

Date Samples Received:

Analysis Type:

April 16, 2012

Turnaround:

TEM, AHERA

24 Hour

Date Samples Analyzed:

April 17, 2012

Client	Lab		Area	Air	Number of	Analytical	Asbestos	Filter	
ID Number	ID N	umber	Analyzed	Volume Sampled	Asbestos Structures Detected	Sensitivity	Concentration	Loading	
			(mm²)	(L)		(s/cc)	(s/cc)	(s/mm²)	
3W-041312 W	EM	877081	0.0800	974	ND	0.0049	BAS	BAS	
3W-041312 N	. EM	87708 <b>2</b>	0.0800	974	ND	0.0049	BAS	BAS	
3W-041312 E	EM	87708 <b>3</b>	0.0800	972	ND	0.0050	BAS	BAS	
3W-041312 S	EM	877084	0.1000	<b>32</b> 0	ND	0.0120	BAS	BAS	

NA = Not Analyzed

Filter Material = Mixed Cellulose Ester

ND = None Detected

Filter Diameter = 25 mm

BAS = Below Analytical Sensitivity Average Grid Opening in mm<sup>2</sup> = 0.010 Effective Filter Area = 385 sq mm

DATA QA

KES ZUUU	RES	233804
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Due Date: 4-(7-(2 Due Time: 5-(5-

# RESERVOITS ENVIRONMENTAL, INC. 9801 Logon St. Derwer, CO 60216 • Ph: 303 984-1886 • Fox 303-477-4278 • Toll Free : 2866 RESHENV

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# **Attachment I**

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type A = Amosite

 $\begin{array}{lll} A &=& Amosite & F &=& Fiber \\ An &=& Anthophyllite & B &=& Bundle \\ C &=& Chrysotile & C &=& Cluster \\ Cr &=& Crocidolite & M &=& Matrix \\ T &=& Tremolite & & & & & \end{array}$ 

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

XGB = partly obscured by a grid bar

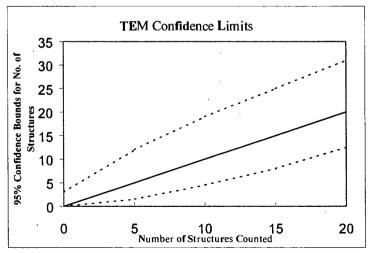
Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

### **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman

Structure Types



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Laboratory name:	REI
Instrument	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid openina area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.058 um
Primary filter area (mm2)	365
Secondary Filter Area (mm2)	
QA Type	

Client :	RAP
Sample Type (A=Air, D=Dusf):	A
Air volume (L) or dust area (cm2)	974
Date received by lab	4/16/12
Lab Job Number:	233804
Lab Sample Number:	877081

F-Factor Calculation (Indirect Preps On	ly):
Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JB
Analysis date	4/17/12
Mettrod (D=Direcf, I=Indirect, IA=Indirect, ashed)	D _
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = y	= no	
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A	H2-1	ND												
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	EZI	ND						6	<b>—</b>					
	C2-1	ND						AB 1	16/12					
B	G2-1	ND						// /		ļ. <u> </u>				
	F2-1	S					:		-					
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Laboratory name:	REI
Instrument	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnification	(20KX) i0KX
Grid opening area (mm2)	0.01
Scale: IL =	0.28 um
Scale: 1D=	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area	
(mm2)	·

Client :	Roth
Sample Tyoe (A=Air, D=Qust):	A
Air yolume (L) or dust area (cm2)	974
Date received by lab	4/16/m
Lab Job Number:	233804
Lab Sample Number:	877082

F-Factor Calculation (Indirect Preps Only):					
Fraction of primtuy fitter used					
Total Resuspension Volume (ml)					
Volume Applied to secondary filter (ml)					

Analyzed by	JB
Analysis date	4/17/2
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Oate Analyzed

Grid	Grid Opening	Structure	No. of St	mctures	Dime	nsions	Identification	Mineral Class			·	1 = ye	es, blank	⊭ no
Gild	Grid Opening	Type	Primary	Total	Length	Width	dentinoation	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	K2-3	ND							·					
	H2-3	ND			Pm	OA	70	e ahu	$\leq 3$	-52	e debus			
	62-3	ND			Par	B	~50	Loin brat	.3	-5%	6 delon 5			
	F2-3	ND						16		<u> </u>				
B	64-1	ND					4	B 4/17/1	2					
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	E3-6	ND						·						
	C3-6	ND		,				,						
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Laboralory name:	REI
Instmment	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnificatibn	(20KX) 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Tyoe	·

Client:	Roth
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	972
Date received by lab	4/46/12
Lab Job Number:	233804
Lab Sample Number:	877083

Analyzed by	JB
Analysis date	4/17/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting miles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):					
Fraction of primary filter used					
Total Resuspension Volume (ml)					
Volume Applied to secondary filter (ml)					

Grid	Grid Opening	Structure	No. of Str	nctures	Oime	Oimensions Identification		fication Mineral Class				1 = ye	s, blank	= no
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	F2-1	MD												
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		_												

Laboratory name:	REI
Instmment	JEOL 100 CX (N) S
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Fitter Area (mm2)	
QA Type	

Client:	RAR
Sample Type (A=Air, D=Dust):	A
Air yolume (L) or dust area (cm2)	320
Date received by lab	4/16/12
Lab Job Number:	233804
Lab Sample Number:	877084

F-Factor Calculation (Indirect Preps Only):					
Fraction of primery filter used					
Total Resuspension Volume (ml)					
Volume Applied to secondary litter (ml)					

	-0
Analyzed by	JB
Analysis date	4/17/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting mles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Strncture	No. of Structures		Dime	nsions	Identification	Mineral Class				1 = y	es, blank	= no
Gild	Grid Opening	Туре	. Primary	Total	Length	Width	tochunoation	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	F3-3	ND												
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### Analytical Procedures - AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

**B**undle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration,  $s/cc = \frac{\text{\# Asbestos Structures}}{\text{\# GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{1L}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> = # Asbestos structures Area Analyzed (mm<sup>2</sup>)

GO = TEM grid opening



April 18, 2012

Laboratory Code:

RES

Subcontract Number:

NA

Laboratory Report: Project # / P.O. #

RES 233893-1 None Given

Project Description:

3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233893-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except In full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely.

Jeanne Spencer Orr

President

# RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

### TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233893-1

Client:

R & R Environmental

Client Project Number / P.O.:

None Given

Client Project Description: Date Samples Received:

3rd West Sub - RMP

Analysis Type:

April 17, 2012

TEM, AHERA

Turnaround:

24 Hour

Date Samples Analyzed:

April 17, 2012

Client ID Number	Lab ID No	umber	Area Analyzed	Air Volume Sampled	Number of Asbestos Structures Detected	Analytical Sensitivity	Asbestos Concentration	Filter Loading
			(mm²)	(L)	Detected	(s/cc)	(s/cc)	(s/mm²)
3W-041412 W	. EM	8773 <b>2</b> 5	0.0900	939	ND	0.0046	BAS	BAS
3W-041412 N	EM	8773 <b>2</b> 6	0.0900	939	ND	0.0046	BAS	BAS
3W-041412 E	EM	8773 <b>2</b> 7	0.0900	939	ND	0.0046	BAS	BAS
3W-041412 S	EM	877328	0.0900	943	ND	0.0045	BAS	BAS

NA = Not Analyzed

Filter Material = Mixed Cellulose Ester

ND = None Detected

Filter Diameter = 25 mm

BAS = Below Analytical Sensitivity Average Grid Opening in mm<sup>2</sup> = 0.010 Effective Filter Area = 385 sq mm

DATA QA

Due Date: \_\_\_

# REILAB RESERVEITS ENVIRONMENTENTENT, INC. 9801 Logen St. Danver, CO 80216 • Ph; 303 864-1980 • Fax 303-477-4275 • Toll Fise :666 RESI-ENV

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# **Attachment I**

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

# Asbestos Type

# Structure Types

Α	=	Amosite	-		Fiber
An	=	Anthophyllite	В	=	Bundle
$\mathbf{C}$	=	Chrysotile	C	=	Cluster
Cr	=	Crocidolite	M	=	Matrix
T	=	Tremolite			

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

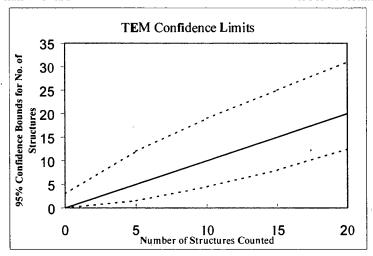
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

# **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid openina area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 10 =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Ciiant :	P+R
Sample Type (A=Air, D=Dust):	A
Air yolume (L) or dust area (cm2)	939
Date received by lab	4/17/12
Lab Job Number:	233893
Lab Sample Number:	877325

Analyzed by	-AL
Analysis date	4/17/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Oate Analyzed

F-Factor Calculation (Indirect Preps Only):									
Fraction of primary filter used									
Total Resuspension Volume (ml)									
Volume Applied to Secondary filter (ml)									

Grid	Grid Opening	Strcture	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = y	es, blank	= no
J	Grid Operining	Туре	Primary	Total	Length	Width	Identification	Amphibole	0	NAM	Sketch/Comments	Sketch	Photo	EDS
A	H2-6	M												Ð
	626	M			Pre	M	90%	wack.	101	la	bin			
	F26	M			lno	y By		Jolla		112				
	826	$\mathcal{M}$			,				, 7					
	026	M											·	
B	H4-6	M												
	GV6	M											·	
	F46	M						·						
	ence	M						,						

## Reservoirs Environmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 10 =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client:	P+12
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	939
Date received by lab	4/17/12
Lab Job Number:	233893
Lab Sample Number:	277326

F-Factor Calculation (Indirect Preps Only):					
Fraction of primary filter used					
Total Resuspension Volume (ml)	•				
Volume Applied to secondary filter (ml)					

Analyzed by	-AL
Analysis date	4/17/12
Method (D=Direct, t=Indirect, IA=IndIrect, ashed)	<b>→</b>
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Afignment	Date Analyzed

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	1dentification	Mineral Class				1 = v	es, blank	= no
GIN	Grid Operang	Туре	Primary	Total	Length	Width	Identification	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	45-1	M					-		,					
	95-1	M			lv	er A	9021	rtact 5-	72	de.	Lis			
	F51	w			Pu	ren B	50%1	ntaes 5- ntaes 5-	77	leb	u. Je	1/4	1/19	1/12
	45-1	M			,								,	
,	(5-1	W)											•	
B	66-1	M		•										
	P61	M												
	261	M												
	C6-1	W												
	/			,										

## Resarvoirs Environmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 10 =	0.056 um
Primary filter area (mm2) Secondary Filter Area (mm2)	385
QA Type	

Client :	P+12
Sample Tyoe (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	939
Date received by lab	4/17/12
Lab Job Numben	233893
Lab Sample Number:	877327

Analyzed by	IL.
Analysis date	4/17/12
Method (D=Direct, I=Indirect IA=Indirect, ashed)	'\nu \nu \nu \nu \nu \nu \nu \nu \nu \nu
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Fraction of primary fittar used	
Total Resuspension Volume (ml)	
Volume Applied to secondary (ilter (mi)	<del></del>

Grid	Grid Opening	Structure	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = yes, blank = no		
		Туре	Primary	Total	Length	Width		Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	146	M								<u> </u>				
<u> </u>	Carp	M			gv	espA.	20% an	tact 50	cs	leb.	rá			
	pub	M			B	rex B	75%	tact 50	100	leb	s Isk	4/4	7/12	
	EUB	M				·								
	C46	M												
B	95-4	W												
	P5-4	M				<u> </u>								
	254	M												
	(54)	M					·	,					:	
									·					

# Reservoirs Environmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX N(S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D =	0.056 ยm
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client:	P+12
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	943
Date received by lab	4/17/12
Lab Job Number:	233893
Lab Sample Number:	877328

Analyzed by	-AL_
Analysis date	4/17/12
Method (D=Direct, I=IndIrect, IA=IndIrect, ashed)	プ
Counting mles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Aligrynent	Date Anaiyzed

F-Factor Calculation (Indirect Preps Onl	y):
Praction of primary filter used	•
Total Resuspension Volume (ml)	-
Volume Applied to secondary filtsr (ml)	

Grid	Grid Opening	Stmcture	No. of Str	uctures	Dime	nsions	Identification	Mineral Class				1 = yes, blank = no		
Grid	Grid Opening	Туре	Primary	Total	Length	Width	identification	Amphibole C		NAM	Sketch/Comments	Sketch	Photo	EDS
A	H26	(N)		 										
	926	M			Ine	r A	858 m	fact 5- whact 50	10/20	lebri	· ا			
	£26	M			\(\frac{1}{\nu}\rangle	ev B	n 70%	whach 50	10	Cobr	10/10	-4/1	7/12	
	826	M												
	c26	M						·						
3	L4-1	W												
	KILI	M												
	44-1	M						•		,				
	94-1	W												
		-												

### Analytical Procedures - AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

**B**undle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

### Equations Used for Calculations

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration,  $s/cc = \frac{\text{\# Asbestos Structures}}{\text{\# GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{1L}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> =  $\frac{\text{\# Asbestos structures}}{\text{Area Analyzed (mm}^2)}$ 

GO = TEM grid opening



Aprll 18, 2012

Laboratory Code:

RES

Subcontract Number:

NA

Laboratory Report: Project # / P.O. #

RES 233894-1 None Given

Project Description:

3rd West Sub - RMP

Eldon Romney R & R Environmental 47 West 9000 South #2 Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. Is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 233894-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer Orr

President

## RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

### TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number:

RES 233894-1

Client:

R & R Environmental None Given

Client Project Number / P.O.: Client Project Description:

3rd West Sub - RMP

Date Samples Received:

Analysis Type:

April 17, 2012

TEM, AHERA

Turnaround:

24 Hour

Date Samples Analyzed:

April 18, 2012

Client ID Number	Lab		Area Analyzed	Air Volume	Number of Asbestos	Analytical Sensitivity	Asbestos Concentration	Filter Loading
ID Number	ID Number		Allalyzeu	Sampled	Structures Detected	Sensitivity	Concentration	Loading
			(mm <sup>,2</sup> )	(L)		(s/cc)	(s/cc)	(s/mm²)
3W-041512 W	EM	8773 <b>29</b>	0.1000	700	ND	0.0055	BAS	BAS
3W-041512 N	EM	877330	0.1000	700	ND	0.0055	BAS	BAS
3W-041512 E	EM	877331	0.1000	704	ND	0.0055	BAS	BAS
3W-041512 S	EM	877332	0.1000	703	ND	0.0055	BAS	BAS

NA = Not Analyzed

ND = None Detected

BAS = Below Analytical Sensitivity

Average Grid Opening in mm $^2 = 0.010$ 

Filter Material = Mixed Cellulose Ester

Filter Diameter = 25 mm

Effective Filter Area = 385 sq mm

DATA QA

Due Date: 4 8-12 Due Time: 535-

# SS01 Logan St. Ownver, CO 80215 • Ph: 303.984-1986 • Far 303-477-4275 • Toll Free :808 RESI-ENV

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	Pager: 303-609 INVOICE TO: (IF			APT									_	DAITA	^T I	ura	DIAAT	aon.			,
Company: (L. & Eurisaments)	Company:	DIFF	EKE	N 1)		Contac	2 Day	_	0.	den	16.			ONTA	<u>CII</u>		RMAT	ION:			
Address: 47 W 9000 5 #2	Address:					Phono:		<u> </u>	No.	/U-K	V W.Y.					Phe	ne:				
Sandy ut. 84070	<del> </del>		Fax:								Fax:										
20.04	Sured W. 9 Polo							07	5ul	-10	239	5			Cat/pager.						
Project Number and/or P.O. #:						ata Oali															
Project Description/Location: 30% (West Sub ~ (CNVP)							du	e (	2m	en	ñνο	·	مدا								
ASBESTOS LABORATORY HOURS: Weekdays: Tam - 7pm			[ 445]	F <sub>11</sub> 1.	REC	UES	TED	AN	LYS	SIS				T	VA	LID	MATR	RIX CC	DDES	LAI	NOTES:
PLM / PCM KTEM) RUSH (Samo Oay) PRIORITY (Next Day	) STANDARD				7	T	11	T	ΪÌ	Ť	П	Ť	i	1		= A			ulk = B	1	
(Rush PCM = 2hr, TEM = 6hr.)	· —				,	- }		}	} }		} }	}	}	$\vdash$		t = D			aint = P	~	
CHEMISTRY LABORATORY HOURS: Weekdays: Sam - 5pm		1			11			1		1			ļ		Soil	= S		W	ipe = W	2	4/8/2
Metat(s) / DustRUSH 24 hr3-5 Day		1	¥	1				-					l	S	wab	= SW	7	F	= Food		
RCRA 8 / Metats & Welding RUSH 5 day 10 day	**Prior notification is regulated for RUSH	盲	Quant			a l	11		န္တို			8		Drink	ing W	aler =	DW V	Waste '	Water ≃ WW		
rume Scan / TOEP	himarounds."	[3]	Preps +		1 1	3	11	1	불	}		黃	22				0 = 0	lher			
Organics 24 tyr 3 day5 Day		1.5 1	0 % 0 %		- 1 13	Metals Scan	11	1	Orand	18	5	ane	2	"A	TM E	1792	approve	d wipe	media only**		
MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pr			frect	1 1			11	1	X   8	1 3	8 8	., Identification, Quantification	Ħ	Ì	1						
E.coli O157:H7, Collfbrms, S.aureus24 hr2 Day	3-5 Day	Lang report,	7402, O-lind	SHA OSHA	_	FEM9.			4 3		5	8	5	ļ	1	-			1	<u> </u>	
Salmonella, Listeria, E.coli, APC, Y & M48 Hr3-5 Day		g				8		, [		8		2	ő	(		1	(	•			
	48 Hr3 DayS Day		Level II, D-vac, IS	7400B, OS	· [ 6]	ğ   ±		•	121	6	8 0	길	SA	1	-		ļ		1		
"Turnaround times assablish a jaboratory priority, subject to laboratory volume and a apply for atternoum, wookenda and holidays."	re not guarantsed. Additional tees			~   4	- Analyte(s)	.   [	Salmonella: +/-	È L	Plate C		* 5	٦.	Ē	Ē	i	١.				ļ	
Special Instructions:		١	AHERA, Jant, Mic	7400A	\$ \ Z	3   3	퍨	<u>?</u>   †	S 2	ě	ğ	17	S.	₹ .	1 8	<u> </u>		,			ga Isto je i
	1	<i>\$</i> €	- 18 j	- 7400A	83 .	. ( §	E 5	Listeria	Aerobic	Coliforms	S'aureu	Moto	<u> </u>	عُ بِهِ	1	賣	Da	ate	Time		niber (Laboratory Ise Only)
Client agains ID avertee (2	Control of State and Control	F.	Semi-qu	PCM .	METALS	ORGANICS - METH	(%) In					. ∖ Ž	SAMPLER'S	Sample Volume	Materia	# Containers	Colle	ected	Collected	۱	ise Only)
Client sarriple ID number (Sample ID's must be unique	<u>) i na kanadan Bibabanka na alam</u>	4	FØ	-	S (	2 0	+-	MIC	CROB	IOLO	ВУ	_	Ø	-	7	*		/dd/yy	hh/nim e/p		2000
1 3W OHISIZW			×		-	- -	++	+		4.	+	4-		700	44	4	4/15	112	ļ. <del></del>	8-1	7329
2 3W-041512 N	<u>glankidadibuda.</u>					1	11	1		L	غاتا			700					tolija iz		30
3 3W-041912 E							$\perp \perp$							704	Ш						_31
A3W-041512S			$\downarrow$											70.	5 4		1			₹	7 32
\$							TT	T													
6								1		1						1					
7	<del></del>	-			-	+	++	1-	+	+	+	+		<del>                                     </del>	+	╁╴			<del> </del>		
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9						4.	11	1	4	1		1		<u> </u>	1.	1	ļ.,			<u> </u>	
10				- 12	1			$\Delta \lambda$									1				
Number of samples received: (Addition	nal samples shall be fisted on a	illach	edig	g form	1.)																
NOTE: REt will analyze Incoming samples based exponintermation received and wiP not the re analysis as bulicated on this Chain of Custody shall constitute an analytical editions agreement	espoosible for arrors or omissions to cal out with asyment terms of NET 30 days	lculatio failure	usor sa	iting from	nanjadan memusa	courac	igho to v	inal di	ta. By	signii mon	19 cliar	t/con	apany rej	orvsontat	ivs ag	rees th	at submit	Ssion of	the following sar	mples for req	uested
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## Attachment I

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

Asbestos Type	Structure Types
A = Amosite An = Anthophyllite C = Chrysotile Cr = Crocidolite	F = Fiber B = Bundle C = Cluster M = Matrix
T = Tremolite	

ND = no structures detected

M = other structure associated with a matrix

NAM = Non Asbestos Mineral

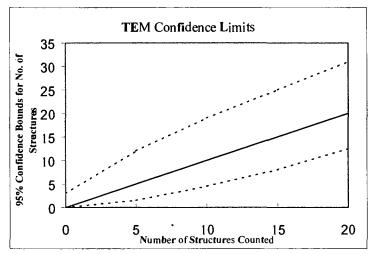
XGB = partly obscured by a grid bar

Sizing Conversion
1 length unit = 5 mm on screen = 0.278 micron
1.80 length units = 0.5 micron
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

### **TEM Analysts**

Jeanne S. Orr Nathan DelHierro Angela Heitger Jonathan Bernard Paul D. LoScalzo Mark Steiner Norberto Zimbleman Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

# Reservoirs Enviranmental, Inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
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Primary filter area (mm2)	385
Secondaty Filter Area (mm2)	
QA Tyoe	

RAR
A
700
4/17/12
233894
877329

Analyzed by	JB
Analysis date	4/18/12
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Oate Analyzed

F-Factor Calculation (Indirect Preps	Only):
Fraction of primary filtsr used	<u> </u>
Total Resuspension Volume (ml)	
Voluma Appilso to secondary filter (mi)	

Grid	Grid Opening	Stmcture	No. ef Str	uctures	Dime	nsions	Identification	tion Mineral Class				1 = y	s, blank	= no
Ond	Cha Opening	Туре	Primary	Total	Length	Width	identification	Amphiboie	C NAM		Sketch/Comments	Sketch	Photo	EDS
A	H3-6	ND				·		L						
	43-6	ND				Pars	A	70% int	m	3.	5% debr	٧s		
	F3-6	ND				Pur	BE	o hint	hut	3-	5% debr	15		
	E3-6	20						/						
	C3-6	ND						B	4/18	-/12				
B	H3-1	ND							"	/				
	631	MD						,						. !
	F3-1	ND												
	E3-1	ND				,								
	F2-1	ND												

## Reservoirs Environmental, Inc. TEM Asbastos Structure Count

Laboratory name:	REI
instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Magni@cation	<b>LOK</b> 10KX
Grid opening area (mm2)	0.01
Scale: 1L =	0.28 um
Scale: 1D=	0.058 um
Primary filter area (mm2)	385
Secondary Fitter Area (nvn2)	
QA Type	

Client:	RAR
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm2)	700
Date received by lab	4/17/12
Lab Job Number:	233894
Lab Sample Number:	877330

Analyzed by	JB
Analysis date	4/18/12
Method (D=Direct,  =Indirect, IA=Indirect, ashed)	D
Counting mles (ISO, AHERA, ASTM)	AH
Grtd storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps	Only):
Fraction of primary filter used	1
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure	No. of Str	nctures	Dimer	nsions	Identification Mineral Class					1 = yes, blank		= no
		Type	Primary	Total	Length	Width		Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	K3-4	ND												
	H3-4	ND			P.	n A	60	soin but	- 3	-5%	debus			
	G3-4	ND			2,1	OB		Lointart	3	5%	Lebuz			
	F3-4	ND												
	C3-4	ND						1B 4	18/12	_	·			
B	G3-6	24						77 "	1					
	F3-6	ND		,										
	E3-6	ND												
	E4-4	ND												
	C4-4	ND												

Page	1	of	

## Reservoirs Environmental, Inc. TEM Astrestos Structure Count

Laboratory name:	REI
Instmment	JEOL 100 CX NS
Voltage (KV)	100 KV
Magnificatkm	20KX 10KX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D =	0,056 um
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	
QA Type	

Client:	RAR
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cni2)	704
Date received by lab	4/17/12
Lab Job Number:	233894
Lab Sampte Number:	877331

Analyzed by	JB
Analysis date	4/18/12
Method (D=Direct, I=indirecL iA=Indirect, ashed)	
Counting miles (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Afignment	Date Analyzed

F-Factor Calculation (Indirect Preps Oni	<u>():</u>
Fraction of primary filter used	•
Total Resuspension Volume (mf)	
Volume Applied to secondary fitter (ml)	

Grid	Grid Opening	Stracture	No. of Str	nctures	Dime	ensions Identification		Mineral Class				1 = yes, blank = no		
·	Crid Opening	Туре	Primary	Total	Length	Width	ider kindation	Amphibole	С	NAM	Sketch/Contiments	Sketch	Photo	EDS
A	L3-3	ND							-					
	K3-3	ND			Pm	o A	60%	nhut	5%	deb	1'5			
	H33	ND			Pu	つ	20 %	in hunt	•	to del	l •			
	43-3	S						/						
	F3-4	MD						1B4/181	12					
3	64-4	M				•		// /: '						
	F44	ND											·	
	E4-4	ND									·			
	F3-1	3												
	C31	ND			·									

## Reservoira Environmental, inc. TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 CX NS
Voltage (KV)	100 KV
Magnification	ZOKX 10KX
Grid opening area (mm2)	0.01
Scale: 1L=	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm2)	385
Secondary Filter Area (n:m2)	
QA Tyoe	·

RAR
A
703
4/17/12
233894
877332

Analyzed by	JB
Analysis date	4/18/12
Method (D=Direct, I=IndIrect, IA=Indirect, ashed)	ď.
Counting mies (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

	F-Factor Calculation (Indirect Preps C	Only):
	Fraction of primary litter used	
	Total Resuspension Volume (ml)	
	Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Stmcture			Dimensions		1dentification	Mineral Class				1 = ves, blank = no		
		Туре	Primary	Total	Length	Width	Identification	Amphibole	С	NAM	Sketch/Comments	Sketch	Photo	EDS
A	H2-4	ND			·									
	62-4	MD			Pond	A	80%	einhat	5%	del	v,è			
	F2-4	ND			Pap	B	60%	inhut	5%	deb	1			
	EZ-4	ND			•			, 						
	CZ-4	WD						do				·		
3	F2-6	ND						B 4/18/1	Z		·			ļ 
	E2-6	ND						/ //-/						
	C2-6	MD												
	C3-6	ND												
	B3-6	M												

### Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber: is a structure having a minimum length greater than or equal to 0.5

micron with an aspect ratio of 5:1 or greater with substantially parallel

sides.

**B**undle: is a structure composed of three or more fibers in parallel arrangement,

with each fiber closer than the diameter of one fiber.

Cluster: is a structure with fibers in random arrangements such that all fibers are

intermixed and no single fiber is isolated from the group.

Matrix: is a fiber or fibers with one end free and the other end embedded or

hidden by a particulate. The exposed fiber end must meet the fiber

definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50<sup>th</sup> structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

#### **Equations Used for Calculations**

Area Analyzed, mm<sup>2</sup> = # GO counted x Average GO Area (mm)

Concentration, s/cc =  $\frac{\text{\# Asbestos Structures}}{\text{\# GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2)}{\text{Average GO area (mm}^2)} \times \frac{1L}{1000cc}$ 

Filter loading, s/mm<sup>2</sup> = # Asbestos structures Area Analyzed (mm<sup>2</sup>)

GO = TEM grid opening